

ITW Paktron

FILM CAPACITORS

AN INTEGRAL PART OF
TOMORROW'S TECHNOLOGY

Exclusive Agent
HATCH ASSOCIATES, INC.

999 N. Main St.

Randolph, MA 02368

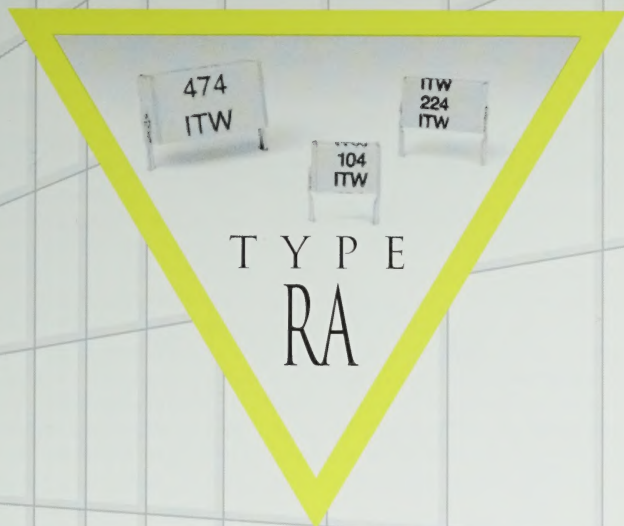
Phone (617) 963-3306 Fax (617) 963-2266

ANGSTOR[®]

CAPACITOR

SELECTION GUIDE

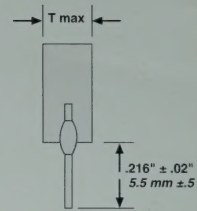
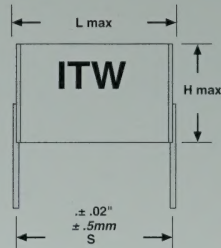
- Multilayer Metallized Polyester
- 5.0, 7.5, 10.0 & 15.0 mm Lead Spacing
- No Voltage Derating to 125°C
- 30% Smaller than Typical Wound Capacitor
- Made in U.S.A.



ANGSTOR®

Capacitor Type

RA



Tolerance: Available in $\pm 5\%$ ($\pm 5\%$ not available below .01 mfd), 10%, 20%

Construction: Non-inductively constructed with metallized polyester dielectric. Parallel plate-multilayer film.

Case: Polyester tape.

Wire Leads: #22 AWG (.025") RA 2, 3, 4. #20 AWG (.032") RA 6.

Marking: Capacitance, tolerance, working voltage and manufacturer printed on container. Parts are continuously marked ITW® and PF code.

Reel Packaging: Available for automatic insertion.

Performance Data: See back of sheet.

ELECTRICAL

DISSIPATION FACTOR: $<1\%$ @ 25°C, 1KHz

INSULATION RESISTANCE: $>10^9 \text{ M}\Omega$

Test voltage @ one minute:

Rated Voltage $<100 \text{ VDC}$ $\geq 100 \text{ VDC}$

Test Voltage 10 VDC 100 VDC

DIELECTRIC STRENGTH: 1.6 x WVDC, 2 Sec.

SELF INDUCTANCE: $\sim 6 \text{ nH}$

MAX. PULSE RISE RATE:

$\text{dv/dt: } .1 \text{ mfd, } 100 \text{ V}/\mu \text{ Sec.}$

TEMPERATURE RANGE:

-55°C to 125°C @ rated voltage

ENVIRONMENTAL

DC LIFE: 1,000 Hours, 85°C, 1.25 WVDC

$\Delta\text{C/C} < 5\%$

DF $< 1\%$, 1KHz, 25°C

IR $> 10^9 \text{ M}\Omega$

MOISTURE: EIA RS-377, P 3.12, 72 hours

$\Delta\text{C/C} < 7\%$

DF $< 1\%$, 1KHz, 25°C

IR $> 10^9 \text{ M}\Omega$ after 4 hrs air dry

LONG TERM STABILITY: After 2 years storage, std. environment $\Delta\text{C/C} < 2\%$

MECHANICAL

VIBRATION: Mil Std 202 Method 204D

PACKAGING: Bulk or Reeled

SOLDER RESISTANCE:

250°C, 5 Sec. $\Delta\text{C/C} < 2\%$

| 63 VDC/ 40 VAC | | | | | | 100 VDC/ 80 VAC | | | | | | 250 VDC/160 VAC | | | | | |
|-------------------------------|-------------------|-------------|-------------------|-------------|--------------------|-------------------|-------------|-------------------|-------------|--------------------|-------------------|-----------------|-------------------|-------------|--------------------|-------------|--------------------|
| Capacitance PF CODE MFD | RA 2 | | RA 3 | | RA 4 | RA 2 | | RA 3 | | RA 4 | RA 2 | | RA 3 | | RA 4 | | RA 6 |
| | S = .197 5.0mm | | S = .295 7.5mm | | S = .394 10mm | S = .197 5.0mm | | S = .295 7.5mm | | S = .394 10mm | S = .197 5.0mm | | S = .295 7.5mm | | S = .394 10mm | | S = .591 15mm |
| | L = .250 6.3mm | | L = .350 8.9mm | | L = .450 11.4mm | L = .250 6.3mm | | L = .350 8.9mm | | L = .450 11.4mm | L = .250 6.3mm | | L = .350 8.9mm | | L = .450 11.4mm | | L = .650 16.5mm |
| | T | H | T | H | T | T | H | T | H | T | H | T | H | T | H | T | H |
| 472 .0047 | | | | | | | | | | | .100 2.5 | .245 6.2 | | | | | |
| 682 .0068 | | | | | | | | | | | .100 2.5 | .245 6.2 | | | | | |
| 103 .01 | | | | | | | | | | | .100 2.5 | .250 6.3 | .100 2.5 | .245 6.2 | .100 2.5 | .245 6.2 | |
| 153 .015 | | | | | | | | | | | .100 2.5 | .250 6.3 | .100 2.5 | .245 6.2 | .100 2.5 | .245 6.2 | |
| 223 .022 | | | | | | | | | | | .115 2.9 | .250 6.3 | .100 2.5 | .245 6.2 | .110 2.8 | .245 6.2 | |
| 333 .033 | | | | | | | | | | | .115 2.9 | .250 6.3 | .110 2.8 | .245 6.2 | .110 2.8 | .240 6.1 | |
| 473 .047 | | | | | | .100 2.5 | .265 6.7 | | | | .145 3.7 | .265 6.7 | .115 2.9 | .245 6.2 | .110 2.8 | .245 6.2 | |
| 683 .068 | | | | | | .120 3.0 | .280 7.1 | .140 3.5 | .255 6.5 | | .170 4.3 | .310 7.9 | .140 3.5 | .260 6.6 | .115 2.9 | .260 6.6 | |
| 104 .1 | | | | | | .100 2.5 | .255 6.5 | .115 2.9 | .240 6.1 | .115 2.9 | .250 6.4 | .225 5.7 | .320 8.1 | .140 3.5 | .310 7.9 | .115 2.9 | .260 6.6 |
| 154 .15 | .100 2.5 | .280 7.1 | | | | .170 4.3 | .290 7.4 | .125 3.2 | .260 6.6 | .115 2.9 | .250 6.4 | | | .190 4.8 | .310 7.9 | .145 3.7 | .285 7.2 |
| 224 .22 | .135 3.4 | .265 6.7 | | | | .220 5.6 | .320 8.1 | .155 3.9 | .280 7.1 | .125 3.2 | .260 6.6 | | | .265 6.7 | .320 8.1 | .190 4.8 | .305 7.7 |
| 334 .33 | .175 4.4 | .275 7.0 | .120 3.0 | .265 6.7 | | | | .190 4.8 | .285 7.2 | .125 3.2 | .265 6.7 | | | | | .250 6.3 | .330 8.4 |
| 474 .47 | .215 5.4 | .320 8.1 | .150 3.8 | .275 7.0 | .125 3.2 | .250 6.4 | | .180 4.6 | .305 7.7 | .145 3.7 | .265 6.7 | | | | | .210 5.3 | .305 7.7 |
| 684 .68 | .185 4.7 | .300 7.6 | .170 4.3 | .305 7.7 | .130 3.3 | .280 7.1 | | .235 6.0 | .325 8.3 | .185 4.7 | .290 7.4 | | | | | .230 5.8 | .340 8.6 |
| 105 1.0 | .220 5.6 | .355 9.0 | .225 5.7 | .325 8.3 | .175 4.4 | .285 7.2 | | | | .230 5.8 | .325 8.3 | | | | | .240 6.1 | .340 8.6 |
| 155 1.5 | | | .210 5.3 | .300 7.6 | .230 5.8 | .315 8.0 | | | | | | | | | | | |
| 225 2.2 | | | .250 6.3 | .350 8.9 | .205 5.2 | .295 7.5 | | | | | | | | | | | |
| 335 3.3 | | | | | .250 6.3 | .350 8.9 | | | | | | | | | | | |

EXAMPLE: .1 MFD $\pm 10\%$ 100 VDC =

RA

104

K

100

RA

3

PF CODE

TOLERANCE

VOLTAGE

TYPE

LEAD SPACING

REEL PACK

J = $\pm 5\%$

063 = 63 V

RA

2 = 5 mm

Add R to

K = $\pm 10\%$

100 = 100V

3 = 7.5 mm

part number

M = $\pm 20\%$

250 = 250V

4 = 10 mm

when required

6 = 15 mm

RA 2 only

HOW TO ORDER

ITW Paktron

P.O. Box 4539, 1205 McConville Road, Lynchburg, Va 24502 Telephone 804-239-6941 FAX 804-239-4730

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More than 10 years ago ITW Paktron developed the highly advanced Interleaf® Technology method of manufacturing. Our plan was to produce a better film capacitor and position ourselves to meet the capacitor design needs well into the 21st century. One result of this new technology is the self-encased, multilayer-film Angstor® Capacitor Series.

The Angstor offers efficient sizing (capacitance vs. volume), high dv/dt (exceeding 100V/μsec for a .1Mfd.), no working voltage derating to 125° C, and the highest quality construction. The self-sealed construction of the RA can withstand severe environments without the addition of costly encasements. The Angstor is an extremely rugged device able to survive severe temperatures and handling. A nail driven through an Angstor will cause no adverse effects other than a small loss in capacitance. It is an excellent filter or noise suppression device as it's construction is essentially a monolithic block with virtually no air.

The following are only a few examples of applications where the Angstor's unique features have proven desirable:

EMI/RFI SUPPRESSION

Applications for EMI/RFI suppression on a variety of motors or field effect devices to protect electronic engine computers and the ever increasing variety of automotive electronics. Noise and/or transients are generated from motors in wipers, window lifts, cooling fans, blower fans,

ABS and suspension controls/pumps, and seat controls.

Metallized film capacitors should be chosen because they are inherently reliable and will fail open rather than fail short in the event of a catastrophic failure. The actual failure mechanism is a gradual loss in capacitance over a very long time, eventually going to an open state. The Angstor will handle the combinations of temperature shocks, voltage and current spikes, vibration, and be equal to, or exceed, the electrical performance of other dielectrics.

PULSE APPLICATIONS

In smaller gasoline engines and gas ignitors, a film capacitor is used as a high energy storage and discharge device for spark ignition. Small engines are used in chain saws, lawn mowers, snowblowers, string trimmers, stand-by generators and a variety of other consumer and commercial products.

The Angstor's superior dv/dt is required in this classic pulse application. The plasma-welded leads provide a radial pull strength exceeding 15 lbs. The use of no dissimilar metals enhances the pulse handling characteristics of the Angstor.

HIGH FREQUENCY POWER APPLICATIONS

As the modern power supply broke the 200KHz switching frequency barrier, the ripple voltage filtering techniques changed drastically. LC (inductor/capacitor) filters must now be very small and efficient components. The choice of capacitors is shifting from

electrolytic to electrostatic types. Because of the extremely low equivalent series resistance (ESR) and equivalent series inductance (ESL) of the Angstor, it is an excellent choice for this application. Larger and denser capacitors based upon Interleaf Technology manufacturing methods are now being designed for switching frequencies to 10MHz.

HIGH TEMPERATURES

Applications include capacitors in the ballast starter, power factor correction in electronic ballasts, and as filters in lighting dimmer/electronic controls.

Two Paktron advantages shine in these applications: the first, our construction makes the parts exhibit virtually no noise in frequency sensitive applications (50KHz+ in electronic ballasts, or 60 cycle "hum" in dimmer controls). The second very important attribute is our Angstor's ability to operate at 125°C with no voltage derating. Normal ballast temperature requirements are 105°C+ and most competitors must derate working voltage above 100°C using polyester film capacitors.

EFFICIENT SIZE

Manufacturers of consumer products, motor speed controls, ground-fault circuit interruption (GFCI), telecommunications and many other electronic systems select the Angstor for its size. Compared to typical wound capacitors the Angstor is 30% smaller.

Compare the features of the Angstor RA Series and you will find ITW Paktron to be **THE choice**.

EFFICIENT SIZE

RUGGED CONSTRUCTION

DOES NOT FAIL SHORT – SELF HEALING

LOW ESR/ESL

NO ENTRAPPED MOISTURE OR AIR IN SELF-ENCASED DESIGN

NO DISSIMILAR METALS TO CHEMICALLY DEGRADE OR ATTRACT MOISTURE

HIGH dv/dt

NO VOLTAGE DERATING TO 125°C

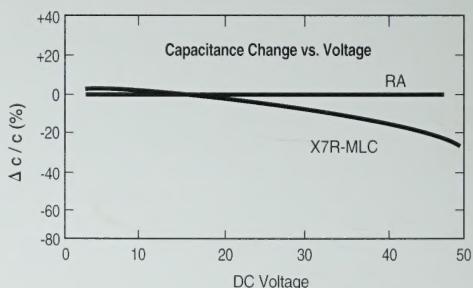
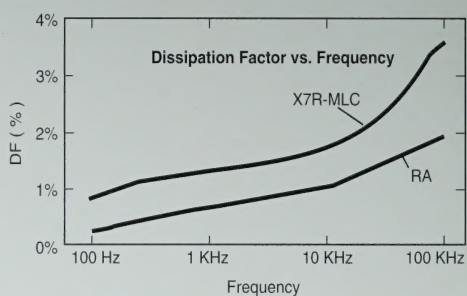
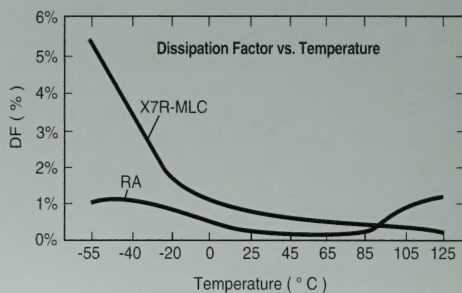
WAVE SOLDERABLE

SPC CONTROLLED INTERLEAF® TECHNOLOGY

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TW Paktron
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Technical drawing of a mechanical assembly showing a cross-section of a multi-hole plate. The drawing includes the following dimensions and tolerances:

- Top horizontal dimension: $.250 \pm .051$
- Left vertical dimension: $.152 \pm .028$
- Left vertical dimension: $.709$
- Left vertical dimension: $+.039 \text{ } -.020$
- Right vertical dimension: $.630 \text{ min.}$
- Right vertical dimension: $.354$
- Right vertical dimension: $+.030 \text{ } -.020$
- Bottom horizontal dimension: $.500$
- Bottom horizontal dimension: $\pm .012$
- Bottom horizontal dimension: $.197 \pm .031$
- Bottom left vertical dimension: $.157 \pm .012$
- Top right vertical dimension: $\pm .079$